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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,161	06/20/2000	Ichiro Okabe	025311/0105	5143

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EXAMINER

DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/597,161

Applicant(s)

OKABE ET AL.

Examiner

José R Diaz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3 and 5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

➤ The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

➤ Claims 1, 3 and 5 are still rejected under 35 U.S.C. 103(a) as being unpatentable over Cheung et al. (EP 0 840 361 A2).

Regarding claims 1 and 5, Cheung et al. teach a method for deposition a film over a substrate (see columns 1-24) comprising the steps of: forming a silicon-oxide-based film (240) on a substrate (200) by a PECVD process (see Fig. 3A, col. 5, lines 12-36, and Section IV: "Deposition of a Capping Layer or Hardmask" in cols. 19-20,); forming a chemically-amplified photoresist (22) (see Fig. 3A and col. 5, lines 12-36); transferring a mask pattern onto the chemically-amplified photoresist layer (see Fig. 3A

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and col. 5, lines 12-36); and etching the underlying layer (see Fig. 3A and col. 5, lines 12-36), wherein the nitrogen content of the surface of the silicon-oxide-based film is made to about 0.1 atm % or less (col. 5, lines 13-17, col. 15, lines 36-37 and col. 16, lines 14-16).

Cheung et al., as stated before, disclose the claimed invention except for a deposition temperature of 500 °C or more. However, Applicant should note that the reference Cheung et al. does not limit the invention to the disclosed range of temperature (see col. 20, lines 29-31), but open the door to other possibility such as temperatures other than the disclosed in the European Patent (see col. 20, lines 36-37). Therefore, Cheung et al. provide a template for the claimed invention, which can be modified as desired. In light of this, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the silicon-oxide-based film at temperature of 500 °C, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. The ordinary artisan would have been motivated to modify Cheung et al. in the manner described above for at least the purpose of reducing deterioration of the photoresist layer by decreasing the concentration of nitrogen in the silicon-oxide-based layer.

Regarding claim 3, lines Cheung et al. teach a further step of exposing the silicon oxide based film to a plasma atmosphere of O₂ or N₂O (see col. 5, lines 2-5; col. 19, lines 25-58 and col. 20, lines 1-59).

Response to Arguments

➤ Applicant's arguments filed January 13, 2003 have been fully considered but they are not persuasive. With regards to arguments that "the Cheung reference is completely silent on using other temperatures, either higher or lower," it is seems that Applicant has overlooked the express teaching provided by Cheung et al. The Cheung reference clearly states that the "process parameters...described herein are representative values ...However, the process described above is not intended to limit the method of the present invention." (Emphasis Added) (see col. 20, lines 32-37). One of ordinary skill in the art recognizes that the term "process parameters" is merely a generic term used to describe a characteristic set of properties of a specific process or method. In the instance case, the process described in the Cheung et al. reference identifies the temperature as one of such properties (see col. 20, lines 28-31). Therefore, the Cheung reference clearly teaches that the temperature of the invention is not limited to only the set of values described in the invention. In order words, the Cheung reference provides a template that can be modified as desired.

With regards to arguments that "Cheung's disclosure...does not eliminate the problem being solved in applicant's invention," Applicant should noted that the Cheung et al. reference in fact solves the same problem disclosed by Applicant. For instance, the Cheung et al. reference discloses the formation of a fine pattern by reducing the footing problem (see column 16, lines 14-16, column 20, lines 18-21, column 22, lines 43-53, and Figures 10A and 10B), which is the same problem described by Applicant on

page 3, lines 23-27 and in Figure 2. Thus, the Cheung et al. reference eliminates the same problem solved by Applicant.

Furthermore, Applicant states that the problem of footing is solved by reducing the nitrogen content of a layer to 0.1 atm% or less, which is achieved by increasing the process temperature to at least 400 °C (see pages 9-10, lines 30-31 and 1-10, respectively; and page 12, lines 17-21). Applicant should note that such required limitations of reducing the nitrogen content of a layer and setting a process temperature at, for example, 400 °C are also taught by the reference Cheung et al. (see, for example, column 20, lines 18-21, and 28-37). Thus, both Applicant and the Cheung et al. achieve the same result by performing the same required limitations. As such, the rejection is considered to be proper.

Conclusion

➤ **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Correspondenc

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00-5:00 Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-3891 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD
March 25, 2003



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800